

What is claimed is:

1. An apparatus using vapor phase deposition comprising:
a deposition part, which comprises:

a process chamber;

a substrate holder installed in the process chamber for supporting a
loaded substrate;

a substrate temperature controller installed in the substrate holder for
controlling the temperature of the substrate; and

a shower head installed opposite the substrate holder in the process
chamber to uniformly distribute organic source vapors to be used for a
deposition reaction onto the substrate; and

a source part, which comprises:

a source chamber for generating organic source vapors to be supplied
to the shower head;

a transfer gas supply source for supplying transfer gas that is used to
transfer organic source vapors to the process chamber; and

a source heater which surrounds the source chamber and allows
organic materials to evaporate to be organic source vapors in the source
chamber.

2. The apparatus of claim 1, further comprising a shower curtain, which is
installed between the shower head and the substrate holder.

3. The apparatus of claim 1, further comprising:

a transfer gas transfer line which is extended from the transfer gas supply
source into the source chamber and includes a transfer gas inlet, which is formed in
a portion extended into the source chamber of the transfer gas transfer line and
allows transfer gas to enter the source chamber; and

an organic source vapor transfer line which is extended from the shower head
into the source chamber and includes an organic source vapor outlet, which allows
organic source vapors transferred by the transfer gas to exit the source chamber.

4. The apparatus of claim 3, wherein the source chamber further includes a transfer gas distributor, which is installed in the source chamber to distribute source gas fed from the transfer gas inlet.

5 5. The apparatus of claim 4, wherein the transfer gas distributor is a conic block or conic plate, of which apex is aligned with the transfer gas inlet.

6. The apparatus of claim 3, wherein the source heater is expanded to surround the organic source vapor transfer line.

10 7. The apparatus of claim 1, further comprising a diluted gas supply source, from which diluted gas is supplied along with organic source vapors to the process chamber.

15 8. The apparatus of claim 1, further comprising a regulator for controlling the flow rate and speed of fluids fed into the process chamber.

9. The apparatus of claim 1, comprising a plurality of source chambers for generating different types of organic source vapors and further comprising:

20 a plurality of transfer lines, which are installed to allow different organic vapors to sequentially enter the process chamber or bypass using time-division; and

a plurality of valves, which are installed to use the transfer lines by time-division.

25 10. The apparatus of claim 1, wherein the source heater is expanded to heat the transfer lines and the valves.

11. A method using organic vapor phase deposition comprising:
generating first organic source vapors by heating a source chamber

30 containing a first organic source material;

transferring the first organic source vapors via a transfer line, which is maintained at a constant temperature to prevent condensation of the first organic source vapors, to a shower head of a process chamber;

causing a deposition reaction by distributing the first organic source vapors transferred via the shower head onto a substrate that is loaded at a position opposite the shower head; and

purging the process chamber after the vapor deposition is completed.

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12. The method of claim 11, further comprising sequentially repeating causing a deposition reaction and purging the process chamber.

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13. The method of claim 10, to form multi-component organic thin films, further comprising:

forming second organic source vapors by heating an additional source chamber containing the first organic material and a second organic material;

transferring the second organic source vapors via another transfer line, which is maintained at a constant temperature to prevent condensation of the second organic source vapors, to the shower head of the process chamber;

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causing a second deposition reaction by distributing the second organic source vapors transferred via the shower head onto the substrate that is loaded at a position opposite the shower head; and

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second-purging the process chamber after the second vapor deposition is conducted on the substrate.

14. The method of claim 13, wherein the first organic source vapors and the second organic source vapors are alternately supplied to the process chamber using time-division by about 0.01 second to several hours.

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